

REMARKS

The Office Action dated February 27, 2009 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1 and 19 have been amended to more particularly point out and distinctly claim the subject matter of the invention. Support for the claim amendment can be found, at least, on page 13, lines 16-23 of the Specification and Figures 5-7. No new matter is believed to have been added. Claims 1-21 are currently pending, of which claims 8-18, 20, and 21 remain withdrawn. Claims 1-7 and 19 are respectfully submitted for consideration.

Reconsideration and withdrawal of the objections and rejections is respectfully requested in light of the following remarks.

Objections to the Drawings

The drawings were objected to because reference numerals 28, 30, and 40 are used to identify features in Figs. 1-8 and then reused to identify modifications of those features in Fig. 9. However, this rejection is respectfully traversed for at least the following reasons.

Figures 1-9 of the application identify reference numbers 28, 30, and 40 as a rolling element, a ring shaped roller, and an inner circumferential wall surface,

respectively. See Specification, page 10, lines 18-22, page 11, lines 6-9, and page 17, lines 7-12. In other words, Figures 1-9 of the application illustrate a ring shaped roller 30 having an inner circumferential wall 40 that includes a rolling surface with which the rolling elements 28 is held.

Figure 9 simply illustrates a different embodiment of the invention in which the rolling elements 28 can be inserted more easily when a radial clearance A is provided between the inner circumferential wall surface 40 and the rolling elements 28. Figure 9 continues to illustrate a plurality of rolling elements 28 retained on the inner circumferential wall surface 40 of the roller 30.

Contrary to the assertion made in the Office Action, reference numerals 28, 30 and 40 are not modified. What is modified is the manner in which the rolling elements can be inserted more easily.

Accordingly, withdrawal of the objection is respectfully requested.

Rejections under 35 U.S.C. § 112

Claim 2 was rejected under 35 U.S.C. §112, first paragraph, for allegedly failing to comply with the enablement requirement. In particular, the Office Action asserted that there is no teaching in the specification on how to achieve the keystone state recited in claim 2, i.e., all of said rolling elements that are inserted into said roller are held in a

keystone state. However, this rejection is respectfully traversed for at least the following reasons.

Page 14, line 4, to page 15, line 10 of the Specification and Figures 6 and 7 clearly support the recitation "all of said rolling elements that are inserted into said roller are held in a keystone state on said inner circumferential wall surface" in claim 2. For example, the Specification clearly describes that all of the rolling elements 28 are placed in the annular step 68. When the cylindrical body 62 is lifted toward the roller 30, all of the rolling elements 28 are pushed altogether into the roller 30. The rolling elements 28 loaded in the annular step 68 are constrained in the space between an outer circumferential surface 62a of the cylindrical body 62 and an inner circumferential surface 64a of the ring 64, and are supported by a wall surface 68a of the annular step 68.

Furthermore, the Specification clearly describes that when all of the rolling elements 28 are loaded in the annular step 68, all of the rolling elements 28 should preferably be kept in a keystone state capable of producing the keystone effect so as to produce a keystone effect. The "keystone state" is described as a state in which the rolling elements 28 are prevented from being dislodged from the inner circumferential wall surface 40 of the roller 30 due to the keystone effect, i.e., a state wherein the rolling elements 28 are placed on the inner circumferential wall surface 40 so as to be able to produce the keystone effect.

In light of the above, a person of ordinary skill in the art, when construing the above-mentioned sections of the Specification with the figures of the application, would readily understand how to achieve a keystone state.

Accordingly, withdrawal of the rejection is respectfully requested.

Rejections under 35 U.S.C. § 102

Claims 1-3, 5-7, and 19 were rejected under 35 U.S.C. § 102(e) as being anticipated by Goto et al. (U.S. Patent No. 5,989,124). The Office Action asserted that Goto et al. discloses all of the elements recited in claims 1-3, 5-7, and 19. However, this rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claims 2-8 are dependent, recites a tripod constant velocity joint. The joint includes a tubular outer member for connection to a transmission shaft. The tubular outer member has a plurality of guide grooves defined in an inner wall surface thereof that are spaced from each other and extend in an axial direction of the tubular outer member. The joint includes an inner member for connection to another transmission shaft, the inner member being disposed in an opening defined in the tubular outer member. The inner member having a plurality of trunnions projecting respectively into the guide grooves. The joint includes a ring-shaped roller fitted over each of the trunnions and held in contact with surfaces defining the guide grooves. The joint includes a plurality of rolling elements rollingly interposed between each of the trunnions

and the roller, the roller having an inner circumferential wall surface. The joint includes a one-sided flange projecting radially from an axial end of the inner circumferential wall surface. The joint includes a holder mounted in an opposite axial end of the inner circumferential wall surface and holding the rolling elements. Before the holder is mounted in the roller, the roller is configured to receive simultaneously all rolling elements configured as an annular array. All of the rolling elements are configured to be placed onto the inner circumferential wall surface in an axial direction of the inner circumferential wall surface, which is a direction opposite to the one-sided flange, and the rolling elements are retained in place.

Claim 19 recites a method of manufacturing a constant velocity joint having a tubular outer member having a plurality of guide grooves defined in an inner wall surface thereof that are spaced from each other and extend in an axial direction of the tubular outer member. A plurality of trunnions are disposed in an opening defined in said tubular outer member and projecting respectively into said guide grooves. A ring-shaped roller is fitted over each of said trunnions and is held in contact with surfaces defining said guide grooves. A plurality of rolling elements are rollingly interposed between each of said trunnions and said roller. The roller has an inner circumferential wall surface, a one-sided flange projecting radially from an axial end of said inner circumferential wall surface, and a holder mounted in an opposite axial end of said inner circumferential wall surface and holding said rolling elements. The method includes before said holder is

mounted in said roller, configuring all rolling elements as an annular array. The method includes simultaneously inserting all of the rolling elements into said roller in an axial direction of said inner circumferential wall surface, which is a direction opposite to said one-sided flange. The method includes before said holder is mounted in said roller, placing all of the rolling elements onto said inner circumferential wall surface with a radial clearance defined between said inner circumferential wall surface and outer circumferential surfaces of said rolling elements. The method includes before said holder is mounted in said roller, after said all rolling elements are inserted altogether into said roller, installing said holder to hold said rolling elements on the opposite axial end of said inner circumferential wall surface of said roller.

As will be discussed below, Applicants respectfully submit that Goto et al. fails to disclose, either expressly or inherently, all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Goto et al. generally discusses a tripod type constant velocity universal joint. In particular, Goto et al. discusses a tripod type constant velocity universal joint with high performance capable of reducing the looseness and the induced thrust when operating in a state with making a working angle. See Goto et al., column 3, lines 12-16. According to Goto et al., all of the rolling elements but one are serially arranged on the cylindrical inner circumferential surface of the roller. See Goto et al., column 16, lines 25-28. The

last rolling element is then forced into a gap g defined between two of the rolling elements. See Goto et al., column 16, lines 28-30.

However, in order to force the last rolling element into the gap g , Goto et al. discusses that the relation between diameter d_1 of the rolling element must be greater than the minimum separation distance d_2 of the gap g such that the difference between d_1 and d_2 has an interference ranging from several μ to several tens μ . See Goto et al., column 16, lines 30-33.

As discussed in the pending application, such a configuration, like the one presented in Goto et al., would allow the rolling elements to fall out of the roller, deform the rolling elements, or prevent the rolling elements from being pressed into the gap g when the tolerances of the inside diameter of the inner wall and outside diameter of the rolling elements are not as small as possible. See Specification, page 2, line 21 to page 3, line 21.

Claim 1, for example, overcome such a deficiency, by reciting, in part,

before said holder is mounted in said roller,

 said roller is configured to receive simultaneously all rolling elements configured as an annular array,

 all of the rolling elements are configured to be placed onto said inner circumferential wall surface in an axial direction of said inner circumferential wall surface, which is a direction opposite to said one-sided flange, and the rolling elements are retained in place.

By at least the aforementioned features of claim 1, by configuring all of the rolling elements as an annular array, all of the rolling elements can be inserted altogether (e.g. simultaneously) into the roller (e.g. be placed onto the inner circumferential wall surface) in an axial direction of the inner circumferential wall surface (e.g. in a direction opposite to the flange). This results in all of the rolling elements to be kept in a keystone state to produce the keystone effect, which locks the rolling elements in place against the inner circumferential wall surface.

It is rather apparent from the aforementioned features of claim 1, that Goto et al. fails to disclose, either expressly or inherently, at least the above-mentioned features recited in claim 1.

This is not a surprise, because in Goto et al. all of the rolling elements except for one are serially arranged in the roller and the last rolling element is forced into a gap between two of the rolling elements. In other words, because the roller in Goto et al. receives all of the rolling elements except for one, the roller in Goto cannot be said to receive “simultaneously all rolling elements configured as an annular array” (claim 1).

Therefore, in view of the above, Goto et al. cannot be said to disclose, either expressly or inherently, each and every element of claim 1. Accordingly, Applicants respectfully request that the rejection of independent claim 1 be withdrawn and this claim be allowed for at least the reasons stated above.

Because claims 2-7 depend upon claim 1, Applicants respectfully submit that claims 2-7 inherit the patentable features therefrom. Accordingly, Applicants respectfully request that the rejection of dependent claims 2, 3, and 5-7 be withdrawn and these claims for at least the same reason as base claim 1, and for the specific limitation recited therein.

Claim 19, which has its own scope, recites features similar to those recited in claim 1. Therefore, Applicants respectfully request that the rejection of claim 19 be withdrawn and this claim be allowed for reasons similar to those discussed above with respect to claim 1.

Rejections under 35 U.S.C. § 103

Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Goto et al. Particularly, the Office Action asserted that Goto et al. discloses all of the elements of claim 4. However, this rejection is respectfully traversed for at least the following reasons.

Goto et al. was discussed above. However, Goto et al. does not disclose, either expressly or inherently, all of the elements recited in claim 1. For example, Goto et al. does not disclose, either expressly or inherently, at least

before said holder is mounted in said roller,
said roller is configured to receive simultaneously all rolling
elements configured as an annular array,

all of the rolling elements are configured to be placed onto said inner circumferential wall surface in an axial direction of said inner circumferential wall surface, which is a direction opposite to said one-sided flange, and the rolling elements are retained in place

as recited in claim 1. Because claim 4 depends upon claim 1, claim 4 inherits the patentable features thereof. Accordingly, Applicants respectfully request that the rejection of claim 4 be withdrawn and this claim be allowed for at least the same and/or similar reasons as base claim 1, and for the specific limitations recited therein.

Conclusion

For at least the reasons discussed above, Applicants respectfully submit that none of the cited references, whether considered alone or in combination, disclose, either expressly, implicitly or inherently, all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-21 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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